



## Brainstorming for ESPAM 3.0

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We're brainstorming here,  
and there are no dumb ideas.  
But if we weren't brainstorming,  
that would have been  
a really, really dumb idea.



## Background

- First brainstorming session during March 2007 meeting
- June 2010 meeting
  - Need to establish model uses/requirements
  - Adopt incremental change paradigm

## Outline

- Current model (v. 1.1/2.0) uses/requirements
- Current model attributes
- ESPAM 3.0 uses/requirements
- ESAPM 3.0 design components (time permitting)



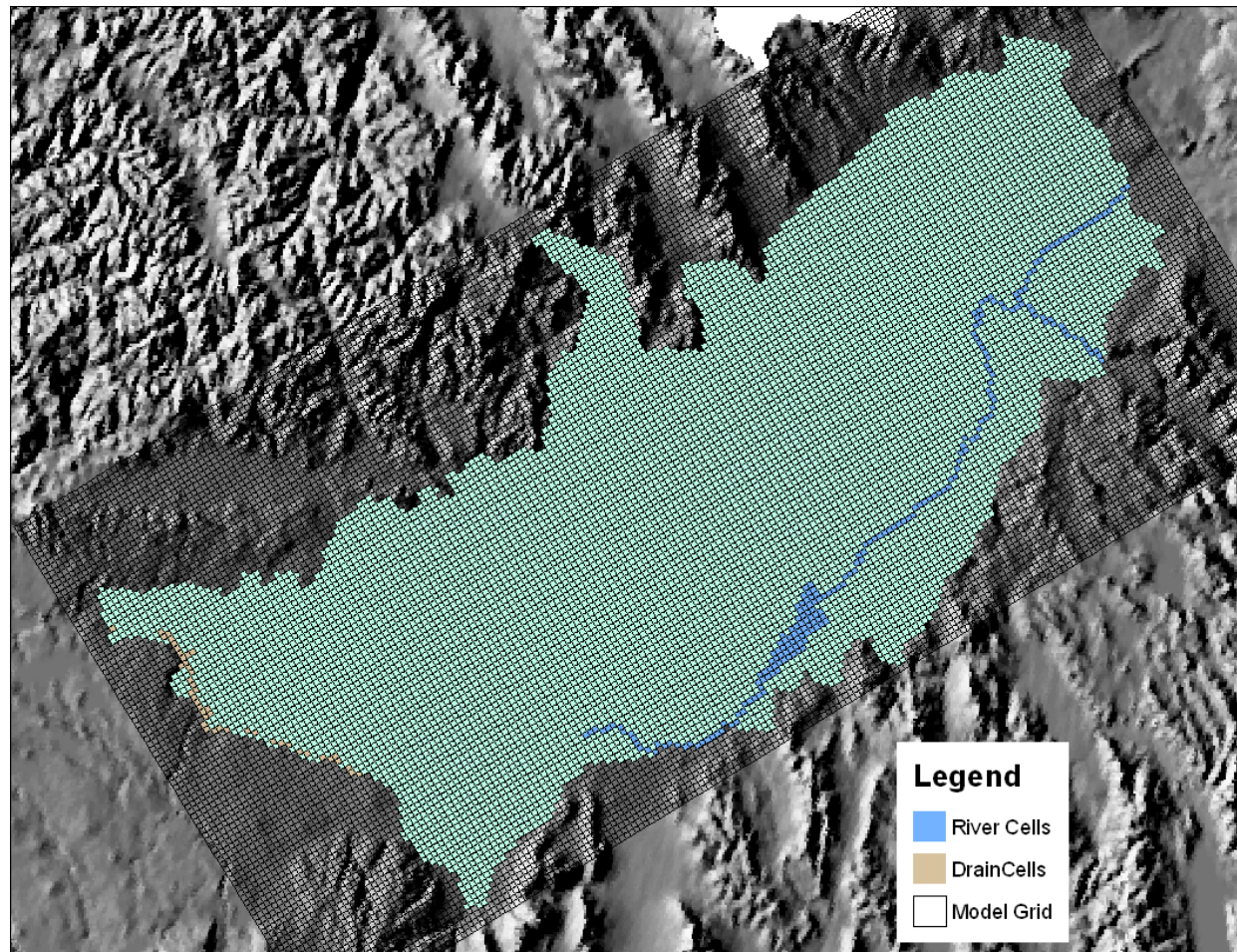
## ESPAM 1.1/2.0 Model Uses

- Evaluate impacts of pumping on Snake River reach gains
- For curtailment scenarios, determine gw priority date to achieve specific reach gain impact
- Evaluate recharge projects and mitigation plans
- Engine for ESPA transfer tool
- Other

## ESPAM 1.1/2.0 Attributes

- Single layer
- Confined/fixed T option in MODFLOW
- Uniform 1-mile grid spacing
- Calibrated w/ PEST
- 1-month stress periods (v. 2.0)
- On-farm water budget (v. 2.0)

## ESPAM v. 1.1

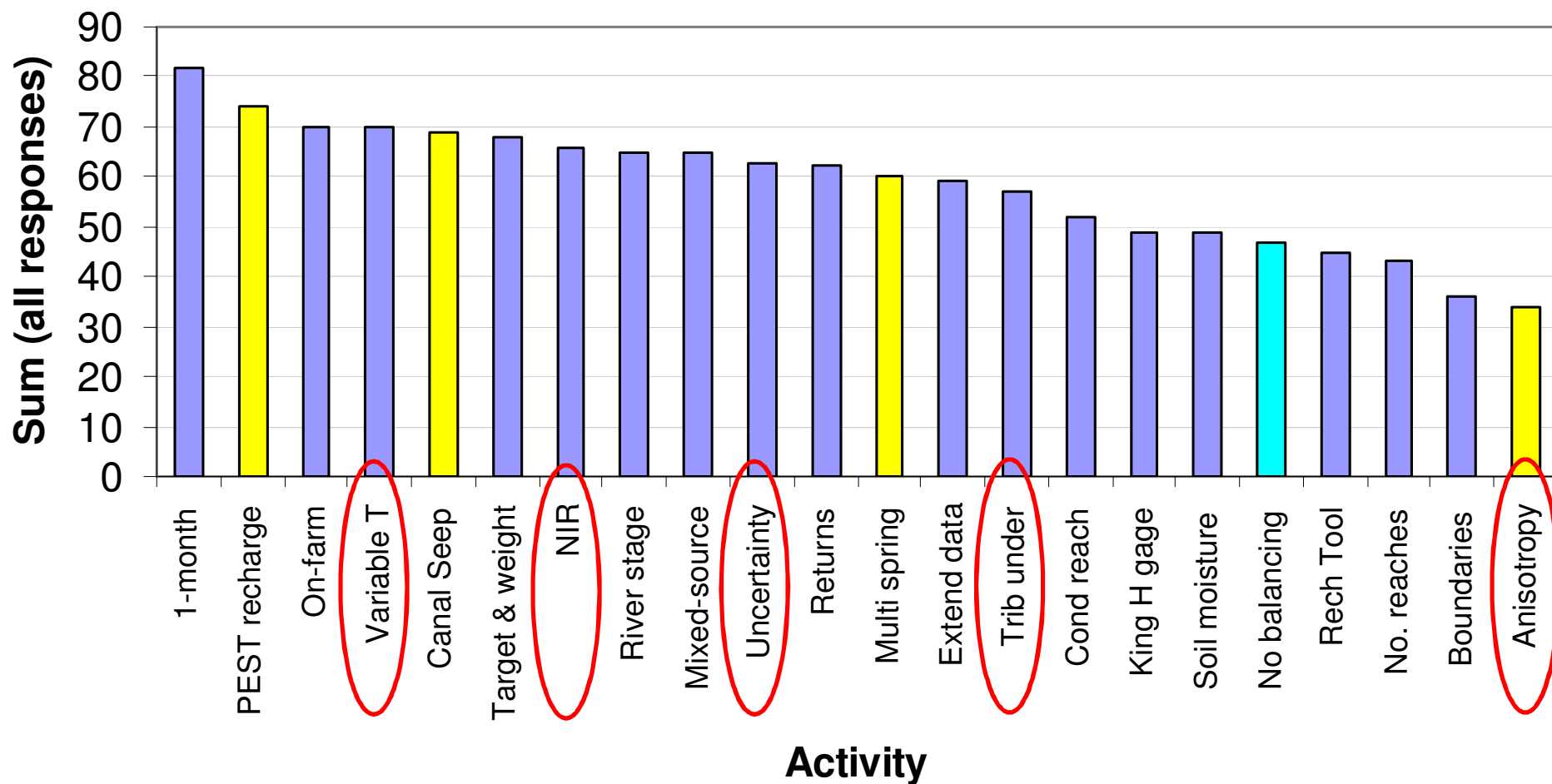


## ESPAM 3.0 Uses/Requirements

- IDWR response to water delivery calls involving gw/sw interaction
  - Stakeholder reps want predictions at scale of individual spring
- Potentially combine with sw model to facilitate prediction of reservoir storage/carryover (for IDWR water admin and/or IWRB planning)
- Facilitate uncertainty analysis
- What if scenarios
- Tools for use by public and technical personnel
- Other



# Activites by Criteria Sums



Yellow: minimum score < 0

Bright blue: maximum score 4

## Previously Proposed ESPAM 3.0 Design Components

- June 2010
  - Thermal calibration
  - Unconfined/variable T option
  - Revise calculation of recharge on non-irrigated land (ET Idaho or VIC model)
- March 2007
  - Multi-layer model
  - Finer grid
  - Earlier start date

## Other ESPAM 3 Design Components

?

	Sep-09	Oct-09	Nov-09	Dec-09
"BIG change paradigm"	Discuss candidate conceptual changes (includes discussion with CAMP on potential applications)			
"Incremental change paradigm"	Discuss candidate conceptual changes (includes discussion with CAMP on potential applications)			

	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10	Oct-10	Nov-10	Dec-10
"BIG change paradigm"	Prioritize conceptual changes	Gather data and experiment with tools and methods for proposed conceptual changes										
"Incremental change paradigm"	Prioritize conceptual changes	Gather data and experiment with tools and methods for proposed conceptual changes										

	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11
"BIG change paradigm"	Re-visit priorities	Continue to gather data and experiment with tools and methods for proposed conceptual changes				Final decision on Conceptual Changes	Gather data and build tools corresponding to selected conceptual model.					
"Incremental change paradigm"	Re-visit priorities	Continue to gather data and experiment with tools and methods for proposed conceptual changes										

	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
"BIG change paradigm"	Gather data and build tools corresponding to selected conceptual model.											
"Incremental change paradigm"	Gather data and experiment with tools and methods for proposed conceptual changes											

	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13
"BIG change paradigm"	Gather data and build tools corresponding to selected conceptual model.					Complete data set - native format	Completion, review and and vetting of tools and methods for conceptual model. Formatting of data for tools and methods.				Processing tools completed, reviewed, accepted	
"Incremental change paradigm"	Gather data and experiment with tools and methods for proposed conceptual changes								Final decision on Conceptual Changes		Gather data and build tools corresponding to selected conceptual model	

	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14
"BIG change paradigm"	Model calibration and uncertainty analysis											Deliver Calibrated Model
"Incremental change paradigm"	Gather data, build tools, continued	Complete data set - native format	Completion, review and vetting of tools and methods for conceptual model. Formatting of data for tools and methods.				Complete data set in model-ready format	Processing tools completed, reviewed, accepted	Model calibration and uncertainty analysis		Deliver Calibrated Model	



## OBJECTIVES

TIME  
&  
SPACE  
SCALES

ASSESS SW/GW INTERACTION

WELL INTERFERENCE

- REGIONAL (eg. A & B)
- WELL TO WELL

INTERSEASONAL IMPACTS

EVALUATE UNCERTAINTY

VADOSE ZONE IMPACTS

## GOALS

REDUCE PREDICTIVE UNCERTAINTY

## PURPOSES

PLANNING MODEL → IWRB

WR ADMIN → IDWR

SHORT TERM  
NEW SCENARIOS

①

## ISSUES

DATA AVAILABILITY

TIME REQUIREMENTS

PLANNING FOR FUTURE DATA REQTS.

CALIBRATION PERIOD



SHORT TERM (CURRENT MODEL)  
NEW SCENARIOS

①

## RECALIBRATION

INTERMEDIATE TERM (18 MOS.)

- ① CHANGE STRESS PERIOD TO 1 MO.  
→ MUST FIRST ASSESS SOIL STORAGE / TRANSIT TIME
- ② EXTEND DATA TO 2006 (2007?)
- ③ TREATMENT OF RETURN FLOWS  
→ LAG FACTORS, REACH-GAIN PROGRAM
- ④ CHANGE RIVER & RESERVOIR STAGE W/ STRESS PERIODS
- ⑤ REAGGREGATION OF CONDUCTANCE REACHES
- ⑥ IMPROVE ESTIMATES OF TRIB UNDERFLOW
- ⑦ MULTIPLE SPRINGS / CELL
- ⑧ REACH GAINS IN MILNER / KING HILL
- ⑨ CALIBRATE TO GAGE GAINS
- ⑩ CHANGE # OF REACHES

## NEW MODEL

LONG TERM

- ① MULTI-LAYER MODEL  
→ PLAN FOR REQUIRED DATA
- ② TRANSPORT CALIBRATION  
→ ISOTOPES / HEAT ETC.
- ③ SUBREGIONAL MODEL(S)
- ④ FINER GRID
- ⑤ EARLIER START DATE